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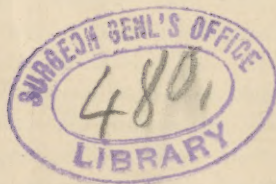
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*Yonah Yonah's book?*







## PARASITELIKE BODIES IN CANCER.

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Of late much attention has been given to the occurrence of parasites in cancer, and the results of many investigations have been published during the past few years urging, in many instances with rare ability, the claims of this or that parasite as an etiological factor. One stumbling block to such observations, however, cannot be too strongly accentuated, that is, the similarity many of the aberrations and degenerations of the epithelial cells of cancer have to certain parasites. The following case is a good example of this kind of mimicry.

On May 5th, 1892, D. F., a laboring man, aged 54, came to my clinic in the University Dispensary complaining of a growth on the lower lip to the left of the median line, which he said he first noticed three weeks before. He smoked, not excessively, but used an old "strong" clay pipe. He did not think he carried the pipe usually on the left side of the mouth. He often suffered from cracks on the lips. The growth itself was about the size of a silver ten-cent piece and sat on the mucous membrane of the lip. Its surface was raw and granular with very little discharge, and its edges were indurated, thickened and rounded. No enlargement of the corresponding submaxillary lymphatic nodule could be made out. He complained that, at times, there were sharp pains radiating from the tumor up along the jaw to the ear. The patient was otherwise in good health. In plain words this was an ordinary case of cancer of the lower lip, the possibility of it being a chancre being excluded by the non-implication of the corresponding lymphatic nodule.

The diagnosis being made, an extensive operation was not thought necessary on account of the recency of the disease, so the tumor was removed by a liberal V-shaped incision. The diagnosis of cancer was confirmed by microscopical examination. In looking over the sections there were found little round and oval bodies scattered about between and in the infiltrating cells of the tumor which could easily be mistaken for parasites. In one field in particular there were found a number of these little bodies deeply tinted by the alum-carmines fluid used in staining the specimen and surrounded by a number of concen-



trically arranged flattened epithelial cells. They looked strikingly like eggs in a nest, but they were not eggs, and they were not parasites, they were clumps of chromatin, and to understand their formation we must first consider the composition of epithelial "pearls," and also some of the degenerations which the epithelial cells in flat-celled carcinoma may undergo.

An epithelial "pearl" is formed in cancer by the cell elements becoming flattened and arranged concentrically around a central cell, group of cells, or a multinucleated epithelial giant cell, as the case may be. Now the nuclei of this center, whether it be a single cell, group of cells, or a giant cell, may undergo either of the two kinds of degeneration mentioned recently by Steinhaus:<sup>1</sup> either the contours and the morphological structure are retained for a long time, only little by little those chemical changes taking place which are recognized by a gradual loss of the property of being colored by stains, or the structure is lost early, and the chromatin runs together in such a way as to change the nucleus into a chromatin mass. Supposing the center of the epithelial "pearl" under consideration to have been either a group of cells, or a multinucleated giant cell, and each nucleus to have undergone the latter change; that is, to have become changed into so many clumps of chromatin, and the intervening cell protoplasm to have disappeared, then we would have this deceptive "eggs in a nest" appearance described above. And this view was strengthened by the facts that under a high power (Zeiss 1-12th, oil immersion) the egg-like bodies had a rough, uneven outline, such as one would expect to find in clumps of chromatin and which would not be found in ova, and in between the clumps there were indications of a homogeneous substance faintly tinged with alum-carmin, which, in all probability, were the remains of the cell-protoplasm of the group of cells, or of the giant cell, which, in the first place, had formed the center. But in the rapidly growing and erroneous cells of cancer this is only one of the many mimics which are calculated to deceive "even the very elect."

There is no doubt that parasites exist in cancerous tissue, especially in cancers which are in direct communication with the surface of the body. This is what one would naturally expect from the nature of things, for the cells of cancer quickly degenerate and degeneration invites parasites. The parasites in cancer and sarcoma may even aid in their malignancy by stimulating cell proliferation and accelerating softening and the forma-

tion of strongly septic substances, as suggested by Verneuil, without having anything to do with the origin of the tumor.<sup>2</sup> But the danger of attributing etiological properties to every parasite found in cancer is well illustrated by the fate of Scheuerlen's bacillus which was soon found to be a common, harmless saprophite of the skin. This bacillus, by the way, has again achieved notoriety by being mistaken for the bacillus of leprosy, and cultivated as such.<sup>3</sup> But during the last few years there has been accumulated a mass of evidence pointing to a group of micro-organisms called coccidia or psorosperms belonging to the protozoa, as the cause of cancer. These coccidia are little monocellular bodies having a well-formed cell-membrane and a distinct nucleus, and it is easy to understand how difficult it might be to distinguish between them and some of the forms of erroneous cell growth in cancer, and in some other diseases of the skin. There are now attributed to psorosperms, with more or less plausibility, four diseases of the skin:<sup>4</sup>

I. A disease called *psorospermose folliculaire végétante* (vegetating follicular psorospermosis), which was first described in this connection and received its present name from Darier and Thibault in 1889. Cases have been reported in this country by Lustgarten and J. C. White.

II. Paget's disease of the nipple. This affection begins like an obstinate circumscribed eczema and ends in a cancer, frank and outspoken. It is not always confined to the nipple, as used to be supposed, but may occur on other parts of the body. Neisser<sup>5</sup> mentions its occurrence on the scrotum (reported by Crocker); two cases where the penis was affected (reported by Tarnowski and Pick); one observed by himself occurring on the anterior axillary fold, and two doubtful cases situated on the neck and on the back (reported by L. Brocq and Morris).

III. *Molluscum contagiosum*.

IV. Some forms of superficial epithelial cancer.

In 1888, Neisser<sup>6</sup> published a remarkable paper, in which he endeavored to prove that the molluscum bodies in molluscum contagiosum were, in reality, coccidia, living in the epithelial cells, and he supposed these coccidia to be the cause of the disease, and to account for its contagiousness. Now this is an affection characterized by epithelial proliferation forming a tumor, and having a tendency to dip down into the subjacent tissues, so there would appear to be only a step between this and



cancer, and in fact, the author entitled his paper "Epithelioma (*sive* Molluscum) Contagiosum." Not, however, wishing to indicate by the name epithelioma that the growth is malignant, but merely that it is an epithelial tumor. Latterly he does not appear to be so sure of his ground, although he still says that of all the diseases attributed to psorosperms this has more facts in its favor than any other, a position which relieves him from what Ex-President Cleveland would call obnoxious partisanship. In 1889 Darier and Thibault<sup>7</sup> discovered what they supposed to be psorosperms in the affection called vegetating follicular psorospermosis, and in 1890, Darier and Louis Wickham<sup>8</sup> found constantly, and in numbers corresponding to the intensity of the disease process, bodies which they supposed to be psorosperms in the "Disease of the mammary areola preceding cancer of the mammary gland," now called Paget's disease.

Here then were three diseases, each characterized by very active epithelial proliferation, by chronicity and persistency, and by a tendency to dip down into the subjacent tissues, and in each of them there had been discovered a parasite which lived in the epithelial cells themselves, and, furthermore, one of these diseases (Paget's disease) is inevitably followed by cancer. The finding of psorosperms in Paget's disease, and the unvarying sequence of cancer in this affection, form the backbone of the whole question, for, as Neisser says,<sup>9</sup> if you allow that psorosperms are the cause of Paget's disease, and if you know that Paget's disease is always followed by cancer, then it is hard to escape from the idea that there must be a closer relationship than mere irritation between the presence of psorosperms and the origin of cancer in this particular disease. Neisser suggests, however, that the figures supposed by Darier and Wickham to be psorosperms in Paget's disease, are, in reality, epithelial cells enclosed in other epithelial cells, and as no culture or inoculation experiments have ever been successfully carried out, this suggestion carries weight. Later still, Karg,<sup>10</sup> who has gone over the ground very thoroughly, expresses himself as follows: "In Paget's disease the formations described as parasites are seen to be young epithelial cells altered by a progressive metamorphosis, and so are differentiated very decidedly from the neighboring cells." But one of the most telling proofs against the theory that these parasitlike bodies are the cause of cancer in this affection is, that neither the cancer itself which follows the chronic eczema of the nipple,

nor any of its metastases contain any of these parasitlike bodies, nor does this cancer, when it once sets in, differ in any way from ordinary carcinoma of the breast.

The inference to be drawn from all this is, that the question of micro-organisms playing any part in the origination of cancer, except through the chronic irritation they may set up, is not proven; even its probability is not yet proven. If a micro-organism should ever be ascertained to be the cause of carcinoma, then it seems to me that it may be found to be brought about, as Klebs suggests, by the micro-organism exercising a spermatie influence on the epithelial cell, uniting with it, and forming a new cell with a vegetative and proliferative activity wholly out of proportion to its original.<sup>11</sup> In the meantime, this search for a pathological *ens* for cancer other than the epithelial cell itself is laudable in every respect, and can only lead to good results. One can only wonder at the immense erudition and research displayed by these investigators, bringing facts from the widest sources of the animal and vegetable kingdoms to bear on this subject.

“ Und alle Näh' und alle Ferne

“ Befriedigt nicht die tiefbewegte Brust.”

<sup>1</sup>Weitere Beobachtungen über Carcinoma-Einschlüsse, von Dr. JULIUS STEINHAUS. *Virchow's Archiv*. Band 127, S. 175.

<sup>2</sup>Propriétés pathogènes des microbes renfermés dans les tumeurs malignes. —*Revue de Chir.*, ix. 10, quoted by NILS SJÖBING, in his article entitled Ein parasitärer protozoartiger Organismus in Carcinomen. *Fortschritte d. Medicin*. Band viii., 1890.

<sup>3</sup>Ein Beitrag zur Cultur des Bacillus Lepre, von A. A. KANTHACK, M. B., B. S., F. R. C. S. und A. BARCLAY, M. B. *Virchow's Archiv*. Band 125, Seite 398.

<sup>4</sup>This classification follows fairly closely that given by L. BROcq in his book *Le Traitement des Maladies de la Peau*. Page 720.

<sup>5</sup>NEISSER: Ueb. d. gegenwärt. Stand der Psorospermosenlehre. Verhandlungen der Deutschen Dermatologischen Gesellschaft. Dritter Congress, Sept., 1891. Ergaenz, zum *Archiv. f. Dermatologie und Syphilis*.

<sup>6</sup>Ueber das Ephemelioma (*sive* Molluscum) Contagiosum, von Prof. A. NEISSER. *Vierteljahresschrift f. Dermatologie und Syphilis*. 1888, S. 553.

<sup>7</sup>*Le Semaine Medicale*, 1889, 101. Quoted by J. COLLINS WARREN, in his article: The Parasitic Origin of Cancer. *Boston Medical Journal*, Vol. 122, No. 3.

<sup>8</sup>Maladie de Paget, Paris, 1890.

<sup>9</sup>NEISSER: Ueb. d. gegenwärt. Stand der Psorospermosenlehre. *Vide supra*.

<sup>10</sup>Ueber das Carcinom von Dr. Med. C. KARG. Festschrift, Herrn, Prof. Dr. C. Theirsch. *Deutsche Zeitschrift, f. Chirurgie*. Band 34, S. 133.

<sup>11</sup>Allgemeine Pathologie von Prof. EDWIN KLEBS. Theill II, S. 778.



